

Mount Diablo Astronomical Society

Diablo Moon Watch

August 2011

GENERAL MEETING

Tuesday August 23, 2011

“Hearts of Darkness -- Black Holes in Space”

By Dr. Alex Filippenko

Professor of Astronomy, University of California, Berkeley

**Doors open at 6:45 p.m.
Concord Police Association Facility
5060 Avila Road, Concord**



Photo credit: Steve McConnell

supermassive black holes are found at the centers of galaxies. Come learn about the remarkable properties of these bizarre objects.

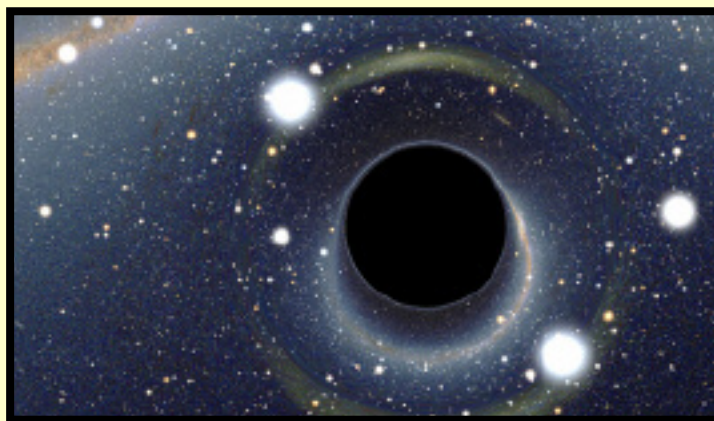
Please join us Tuesday, August 23rd to listen to Dr. Filippenko for an entire evening lecture followed by a question and answer period.

Alex Filippenko received his Ph.D. in Astronomy from Caltech in 1984 and joined the UC Berkeley faculty in 1986, where he is currently the Richard and Rhoda Goldman Distinguished Professor in the Physical Sciences. Elected to the National Academy of Sciences and one of the world's most highly cited astronomers, he has coauthored more than 670 scientific publications and is the recipient of numerous prizes for his research. He was a member of both teams that discovered the accelerating expansion of the

Universe, voted the “Top Science Breakthrough of 1998” by Science magazine. Voted the “best professor” on the UC Berkeley campus a record eight times, and winner of the ASP's 2010 Richard H. Emmons Award for undergraduate teaching, he was also named the Carnegie/CASE National Professor of the Year in 2006 among doctoral institutions. He has appeared in numerous television documentaries, coauthored an award-winning textbook, and produced five

Black holes are regions of space where gravity is so strong that nothing, not even light, can escape!

No longer confined to the fertile imaginations of science-fiction writers and theoretical physicists, numerous black holes have recently been discovered by observational astronomers. Stellar-mass black holes can form during the deaths of some types of massive stars, and



astronomy DVD courses with The Teaching Company (including a 12-lecture course on black holes, chock full of information).

PRESIDENT'S CORNER

TAM Nine (The Amazing Meeting) From Outer Space!

by Chris Ford

This month, I would like to give you a flavor of a highly entertaining event called "The Amazing Meeting" that I attended with my son at the South Point Hotel in Las Vegas last month. You may wonder what the connection is to astronomy, yet under the radar this meeting has become one of the most interesting public forums in the USA devoted to sci-

less demystifier of scams, supernatural and pseudo-scientific claims, and the relentless scourge of Uri Geller. It is an annual forum that over 4-days promotes science, skepticism, and critical thinking, and to this author it is hard to think of a public event that attracts all in one place such a diverse range of high profile media science personalities, all of whom are accessible,

available, and willing to chat one on one. This years ninth TAM was the third I have attended with my 19 year old son Alex who was part of a strong student representation amongst the 1,650 attendees. The promotion of the values of science and critical thinking for future generations are essential to the future of our nation and a key sub-theme of TAM.

This year

The Amazing Meeting was promoted as "TAM 9 from Outer Space", a pun on the famously awful movie of that name. Some of the most prominent personalities in the astronomical media and blogosphere were in attendance including "Bad Astronomer" Phil Plait, Bill Nye The Science Guy,

Neil De Grasse Tyson, Pamela Gay of "Astronomy Cast", and "The Physics of Star Trek" Laurence Krauss, who also all participated in a panel entitled "Our Future in Space" with a unsurprisingly wide range of opinions. Other high profile scientific media personalities at TAM 9 included Professor Richard Dawkins, Michael Shermer, biologist P Z Myers, Richard Wiseman, as well as magicians Banachek,

Penn and Teller, and of course James Randi himself. Unfortunately absent at the last minute was usual regular, Adam "Mythbusters" Savage.

There is always a strong astronomical and space component to TAM

To give a sense of its content the famous evolutionary biologist Richard Dawkins delivered an excellent talk on alien contact, while P Z Myers of the Pharyngula blog presented a "Skeptical Look at Aliens", and



Bill Nye signing an autograph for my Son Alex.



A stellar Astronomy speakers panel. (Left to right: Phil Plait, The Bad Astronomer, Bill Nye The Science Guy, Neil De Grasse Tyson, Pamela Gay of Astronomy Cast, and "The Physics of Star Trek" Laurence Krauss)

ence and critical thinking, with a regular emphasis on astronomical subjects whether it is the possibility of alien life, the future of space science, the evolution of the solar system, or even the possibility of UFO's.

The Amazing Meeting (TAM) was founded in 2003 by James Randi

He is well known as a stage magician, escape artist, and tire-



Keynote speaker the irrepressible Neil De Grass Tyson in full flow...

TAM Nine From Outer Space! (Continued from previous page)

Pamela Gay gave an impassioned plea for the continued future of the James Webb Space Telescope and what its loss will mean for science educa-

tion in the nation. Finally, Neil De Grasse Tyson, who in my opinion is the most entertaining advocate for astronomy public outreach was the keynote speaker at TAM 9 and on fine form. His speech centered on the

consequences of living in a society where science literacy is not given proper priority, giving many examples from his personal experiences. If anyone has seen Neil live, you will know he is an incredibly knowledgeable, charismatic, and funny speaker, and an amazing advocate for astronomy. In fact the back and forth dialogue between Neil and Bill Nye on one panel was so hilarious that

someone tweeted during the event that they should do a buddy cop routine! Needless to say, Neil caught the tweet live on stage and



My son Alex and I with James Randi (aka "The Beard")

duly showed it on screen during his keynote.

As is evident from the above speakers, TAM is a highly eclectic mixture of personalities from the sciences, arts, and entertainment.

It is also one of the most entertaining and yet mentally challenging meetings that you are

likely to encounter, and yet it is not technical and always highly accessible. There is definitely a distinct flavor to TAM that is as much about being in the company of others who value the importance of science, education, and logical reasoning. I cannot think of another forum that includes so many well known faces from such a diverse range of disciplines, and for around \$375 per person for 4 solid days, it is great value, and that includes breakfast and lunch thrown in for the price also.

If you are interested in the scientific method, critical thinking, love astronomy and space, or are frustrated by the poor reporting of science in the media, TAM may be just the tonic for you.

<http://www.amazingmeeting.com/>

Chris Ford

An Honest Look at UFO's

by Nathaniel Bates

UFO's and amateur astronomy do not go together.

Better put, UFO's and amateur astronomers often do not go together. Skeptical writers often go to great lengths to discredit the UFO narrative. In this essay, I intend to try my best to take a broad view of the UFO phenomenon, and to see to it that I do not take the dismissive approach that so many skeptics take. Indeed, nothing is more insulting than to be told that one is incapable of distinguishing Venus from a moving object, or swamp gas from something truly unexplained. At the same time, one cannot abandon proper scientific skepticism in order to embrace a True Believer mentality that accepts claims of alien contact uncritically. Astronomers are right to sound a note of caution when approaching this subject.

What is the truth here?

Let me begin by telling a story of my own. I was at camp, and it was late. We were all up after dark, making life miserable for the Counselors. It was a teenage thing, if you remember those days. Some friends of mine were staring up at a mysterious object that was flickering in the dark winter sky. They were in absolute awe of an object that was turning blue and red in an alternating

manner. They turned to me and asked me whether or not this was a UFO. I smiled and told them that they were viewing Sirius, a very near star about nine light-years away. Sirius could appear to be a brilliant flickering object due to the very moist Marin county winter sky, and the interesting seeing that the Pacific Ocean produced. I suppose we can add Sirius to Venus or swamp gas and admit that it is possible that people can mistake astronomical phenomena for UFO's.



Add to the mix the International Space Station, satellites, and strange airplanes.

We cannot rule those out as possibilities. So, how do we begin here? I think that we have to begin by a proper understanding of what intellectuals call the "Null hypothesis." The Null Hypothesis is what we assume to be true in lieu of extraordinary proof. For debunkers, the Null Hypothesis is that all UFO's can be explained by Venus, Sirius, Swamp Gas, Airplanes, Satellites, or overactive imaginations. I believe that this is the wrong approach to begin with. The Null Hypothesis is not so simple when we really get in to philosophy or logic. If we

begin with a Null Hypothesis that conforms to our own point of view we have begun with a dishonest premise. A debunker should not begin with a Null Hypothesis that UFO's are non-existent. The Null Hypothesis is most honest when we assume that it is the opposite of what we are trying to prove. If one is trying to debunk a position, often one should begin by assuming it to be potentially true and then showing it to be false, especially in lieu of overwhelming evidence either

way. My point of view runs contrary to the traditional skeptic methodology that merely showing that a claim does not meet the bar of evidence is enough. I believe

that the burden of proof is on any claim that is made about UFO's, pro or con. If one is a skeptic, one does best by postulating that the belief could be true and the probing the believers with intelligent questions to see if their claims line up with reason.

Therefore, we should begin by assuming that some UFO's might really be alien space craft and then evaluate how logical this claim is. We would see whether this claim lines up with logic, reason or science. This is a more reasonable path for skeptics than to begin by assuming that all of these are natural phenomena and then putting the entire burden on UFO supporters. Posit that UFO's

An Honest Look at UFO's (Continued from the previous page)

are potentially real, and then proceed with a number of skeptical questions. For one thing, we have to ask ourselves why these UFO's are here. Why visit our planet? This is not an unimportant question. Some have alleged that the aliens want to interbreed with humans because their DNA is frag-



ile and they cannot reproduce on their own world. This claim runs up against an obvious problem. It is impossible for two distantly related species to join their DNA through natural means. It is extremely hard even for closely related species to interbreed. It would be utterly inconceivable for a completely alien species that evolved on another world to interbreed with humans. Finally, it would seem natural that advanced aliens could solve the issue of DNA fragility without needing to travel many light years.

Now, for those who have claimed such contact with aliens I can only say that their accounts are sincere.

They are not making anything up, and I believe that they are often well adjusted and lucid people who make this claim. They are reporting what they believe has happened to them. However, they cannot fault me for applying scientific skepticism to the claim that alien genetic codes could ever match human DNA. This is even assuming that aliens are carbon based, which is not an unreasonable assumption but still an assumption on our part. I do not claim to explain away the claims of those who claim to be abductees or to

mock them (as has so often happened), merely to posit what I believe is a valid scientific question that advocates for alien-human breeding should address.

The other question that should be posed is the question of why the aliens described often seem banal.

They resemble Earth type organisms. Often, they even resemble humans. Would a planet potentially unlike Earth produce an organism that looks like a bipedal human with two hands, two feet and a head? I can think of other questions that should be posed. There is one important question that is often overlooked. While some might object that the

UFO's do not land on the White House lawn, my own personal question is, "Why they are not better hidden?" If I were visiting a planet, I would take a stealth position. I would observe, and not show myself to those violent primates on the ground because they have a tendency to shoot at what they do not understand. Strangely, however, the UFO aliens of the popular consciousness show themselves freely. Their reported appearance does not conform to what I would expect from a Universe in which life can take myriads of forms. The purported UFO aliens are mostly humanoid, resembling humans with superficially altered forms.

Now, I want to make something clear.

I am of the opinion that the Universe is potentially teaming with life. And, I am also of the opinion that intelligent life may well have been visiting Earth over the course of our history! Yet, even there we have to address the question of Relativity. Although we do not know enough about the complexities of Relativity and Quantum Theory to rule out stable wormholes and other anomalous phenomena, as it stands now complex matter is bound by the speed of light. This means that an alien space craft cannot travel at the speed of light. A ship traveling near the speed of light from the center of the galaxy to Earth would indeed experience very little passage of time. However, that is due to time dilation which allows for a shorter passage of time on board ship. The fact is

An Honest Look at UFO's *(Continued from the previous page)*

that a great deal of time will have passed, over 27,000 years! The aliens would have to be very committed to such a journey because, although their experience of time is vastly less than 27,000 years, they would return to their home worlds many thousands of years in the future. Finally, the actual fact is that their ship will probably be limited to about ten percent of the speed of light due to the threat of space debris. But, then again, to be fair we cannot rule out the possibility of laws of physics currently unknown that could be harnessed for space travel along much shorter timelines. It may well be that a vastly more advanced species will have discovered those laws by now.

Really, to be honest, the possibility of alien intervention in to Earth's biology is not beyond the pale.

It may be possible that such outlier events as the Cambrian Explosion could defy easy explanations such as "natural selection." Such periods of rapid evolutionary change does open the possibility that life got a little outside help that allowed multi-cellular organisms to thrive, making Earth a far more interesting world than before. I cannot rule out such possibilities, or even the idea that aliens might have visited Earth during human history. I will even go so far as to suggest that some UFO's today might be alien in nature. Yet, with the physics we now currently work with, traveling to Earth from a distant planet would take a great deal of time.

Some intervention in to our planet's biology is one thing. Continual intervention would imply that our planet is special to them in some way. Would it be fair to expect that Earth is special to a galaxy teaming with life?

Let me explain my methods. I begin with a Null Hypothesis that can include the possibility of some kind of alien visitation. I begin with the possibility that UFO's could exist and then, at that point, I enter in to a skeptical dialogue with the claims provided me. In other words, I take the arguments of the UFO believers and address them critically. If UFO

researchers tell me that there is a government conspiracy to cover up UFO's, I then have to counter by stating that governments often lie about what they are lying about. We have to consider the possibility that the Cold War necessitated cover stories for advanced technology. If an American military man does not want the Soviets to know about some new technology, an alien cover story becomes a very tempting way of doing damage control. UFO researchers seem

largely unwilling to consider this possibility. This is a logical possibility when we consider that a great many sightings have been near military bases. Such military cover stories might take off in to the culture, inspiring science fiction and fantasy. Perhaps whole UFO religions emerged out of seeing advanced stealth technology much as Cargo Cults arose during World War II from sightings of American aircraft!

Now, I promised that this

would be an honest look at UFO's instead of a knee-jerk skeptical look and I intend to fulfill that promise. I began by stating that I had to begin with a "Null Hypothesis" that some UFO's might be alien space craft until or



unless I can disprove such a claim. This is the most honest approach I can take, far more honest than an approach that automatically excludes even the possibility of alien visitation unless proven. It is possible that alien contact has occurred, and that it is not provable given current scientific methods. Assuming our science can prove all things is arrogant on the part of a new species that has only been technological for a few hundred years. Have I disproven the Null Hypothesis?

An Honest Look at UFO's (Continued from the previous page)

No, I have not. I had better be honest about that.

Sane people, of sound mind and body, have claimed experiences with UFO's.

This cannot be denied. I believe that explanations other than the alien explanation should be considered, including the possibility that agencies on Earth may have very advanced technology. At the same time, however, the Universe is potentially teaming with life and it may well be that at some point planets unable to deal with population pressures then expand in to space. Such civilizations may take an interest in up and coming planets like ours, perhaps preferring to expose themselves to humble people in the woods than to governments.

Conversely, it may also be that we are of no interest to anyone; that we are, as Carl Sagan suggested, better off listening with radio astronomy than looking to space craft to come from the sky. For Carl Sagan and Frank Drake, the real way to alien contact was through SETI. Most scientists doubt the UFO claims, but the great majority of scientists do see alien life as possible. It is simply that they pin their hopes on mathematical patterns revealed by radio astronomy. For them, SETI is

our ear to the sky while UFO's are banal and boring; hardly fit to inspire us with a sense of the diversity of technologies that could exist in our Universe.

Sadly, however, the SETI array is down.

In this political climate, it may well never return. In times of grave anxiety like our own time, human mythologies often turn to the stars. Many UFO believers claim that aliens will come and save us from ourselves. Many of



their narratives are implicitly religious. More often than not, religious and secular salvation narratives will emerge when rational science does not appear to have the answers, particularly in times of grave ecological crisis where many justifiably blame human technological arrogance for environmental destruction. Personally, I do not oppose such hopes, because I believe that we may well be genetically hardwired to believe in Utopia and to hope for a better world than we have created for ourselves. However, in

judging any new natural phenomena, or any claim such as UFO's, science is the best system we have. In that spirit, those who claim that UFO's have arrived and that we are in the midst of alien contact should be able to address a number of scientific questions, among them how the aliens resemble Earth forms, but also how the aliens can travel so freely when Relativity limits travel to less than the speed of light. I am the kind of skeptic who can be convinced. At the same time, I am

the kind of potential believer who needs hard evidence and a theoretical model that can fit the hard evidence. Sadly, the ability to gather evidence has decreased due to the decline of SETI and we might be left

with speculation alone. If we are a Galaxy teeming with life, as is hoped, then we need more than speculation to give us a sense of where we fit in the vast social network that extends throughout the starry disk we call home.

Jupiter, the Amateur Planet Returns.

by Jim Scala

Go out before sun up any morning, and you'll see Jupiter as a bright star high in the south-eastern sky.

Earth is catching up and will pass Jupiter – be at opposition – on October 29th. Jupiter is high, at 12° declination. Beginning in 2005 its oppositions were at negative declinations and that translates to the planet being low in our bay area skies. The higher the



Ganymede's shadow passes across Jupiter July 23, 2011 at the times shown on the image.

you'll ever attend. Possibly the most interesting are its four Galilean Moons.

and very good seeing. However, in modest seeing a six inch telescope shows the moon's shadow (a solar eclipse on Jupiter) passing across the planet. Image two, a sequence of images showing Ganymede's shadow passing across Jupiter on July 23, 2011. It also illustrates that Ganymede's orbit is highly inclined to Jupiter's equatorial plane, so its shadow actually passes near the pole. Since the image is inverted (as seen in the scope) it's actually the Jupiter's South Pole. Watching an eclipse on Jupiter gives an excellent perspective on planetary dynamics.

Jupiter is never without detail.

About 150 years ago Cassini observed a storm in Jupiter's dense atmosphere that was bright red and has persisted since then. It was called as the Great Red Spot. In recognition of its color. Over these 150 years its color has gone from red to salmon and all shades in between. Currently, it's mostly salmon colored. It has also changed size over the same period and is now somewhat smaller than when it was discovered. The great red spot makes timing Jupiter's rotation easy. Image three shows the great red spot on July 28th as it crossed the planet. The differences in brightness brings



Jupiter's four Galilean Moons at 0500 on July 30, 2011 as seen and imaged through a four inch telescope. The orientation is reversed as seen in the telescope. This is a composite of two images; one for the moons and one for the planet.

better for planetary observing because your telescopes is looking through less atmosphere and that translates to less turbulence.

We call Jupiter The Amateur Planet, because since Galileo turned his simple scope on it in 1645 we've realized it exhibits the most pleasing, spectacular and changing views of any planet we can observe. Excellent views can be had any optical aid from binoculars up to and including the Hubble Space telescope. But, the most interesting and spectacular observations start with 7X50 binoculars and telescopes from four (100-mm) to twelve (300-mm) inches of aperture. That optical range includes just about any star party or group observing

Jupiter's Moons Are For Everyone.

Binoculars or a 50-mm telescope easily shows the four brightest moons discovered by Galileo. They are like a small solar system that changes positions from night to night. As you look at them, let your mind wander and think of what it must have been like to be the first person to ever see them. On that day it was the greatest scientific discovery ever made. Image one shows them nicely.

Watching solar eclipses on Jupiter.

To watch a moon pass in front of Jupiter requires at least an eight inch (180-mm) telescope

Jupiter, the Amateur Planet Returns. (Continued from the previous page)

out the effects of seeing and is not inherent in the image. It illustrates how the atmosphere affects observation. The last image at 0538 PDT was taken against a light blue twilight sky.

There's more activity then the Great Red Spot.

About five years ago Jupiter entered a period of increased activity resulting from several cyclic changes that occur in our solar system. These cycles, generally known as the Melankovic cycles make interesting reading. This has increased the interesting and exciting detail that can be observed. Image four shows Jupiter without the great red spot.. It illustrates quite nicely the incredible detail awaiting your telescope.



Jupiter on July 4, 2011 showing many cyclones and other activity in its incredible atmosphere.

As you look over the four images that illustrate this article I hope you will agree with me that



Jupiter's great red spot crossing the planet on July 28, 2011.

designating Jupiter as The Amateur Planet is correct.

Would you like to take images like the ones shown here?

I took these images from my backyard observatory in Lafayette. You can take similar images in line with the limits of your telescope and camera. Five years ago a small group of interested MDAS members started the MDAS Imaging group. We meet on the second Tuesday of the month from 7:00 p.m. to 9:00 p.m. at the Walnut Acres elementary school. All the details are on our web site at:

<http://tech.groups.yahoo.com/group/mdasimaging/>.

Mount Diablo Astronomical Society Event Calendar–August 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6 Sunset: 8:14 PM 
7	Board Meeting (Private) 8	9	10	11	12	Observatory Maintenance (Private) 13 Sunset: 8:06 PM 
14	15	16	17	18	19	7:30 PM Astronomy: OTHER EARTHS? 20 Sunset: 7:57 PM
21 	22	7:15 PM GenMtg: Black Holes 23	24	25	Idaho Star Party 2011 26	Idaho Star Party 2011 27 Society Observing (Private) Sunset: 7:47 PM
28	29 	30	Oregon Star Party 31	1	2	3

Board Members & Address

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MDAS

P.O. Box 4889

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General Meetings:

Fourth Tuesday every month,

except on the third Tuesday

Refreshments and conversations

Meetings begin at 7:15pm.

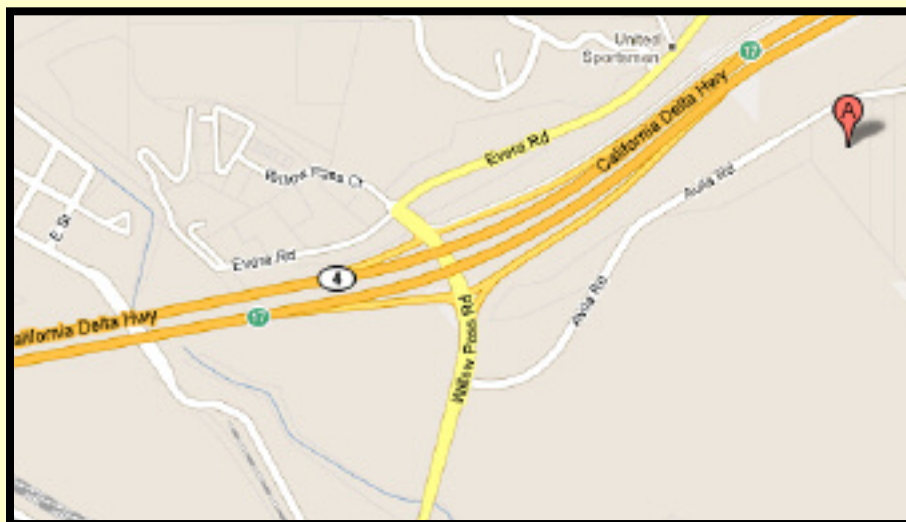
Where:

Concord Police Association

5060 Avila Road, top of the

Take Avila Road from Willow

Directions to facility:



Your Help Would Be Greatly Appreciated

Our association need a few members to come at 6:30 p.m. before our monthly meeting which starts at 7:15 p.m. to help in seting up the chairs and other elements needed to conduct the general meeting.

Similarly at the end of each meeting the chairs and tables have to be removed, the room has to be cleaned and the garbages emptied.

Thank you for your help.

